Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

EDITORIALS.

THE doctrine of isostasy has been tentatively accepted by many working geologists. It finds application in various departments of geology, but nowhere more conspicuously than in glaciology. Without passing judgment on the doctrine, and without attempting to restrict the field of its application, attention is called to a misapprehension to which it has given rise. This misapprehension is widespread in the popular mind, and has even found a foothold among those who have given attention to glacial geology.

Among the hypotheses which have gained more or less currency in explanation of the Pleistocene glacial climate, is that of northward elevation. Whatever may be thought of this hypothesis from *a priori* considerations, or whatever may be thought of the evidence which is adduced in support of it, it has come to have an appendix which we believe to be false. This appendix seems not to have accompanied the hypothesis at the outset, and some of the advocates of the hypothesis do not appear to have given their sanction to the appendix, though their names are sometimes connected with it.

The hypothesis is, that northward elevation lowered the temperature of the region affected to such an extent as to occasion the accumulation of the Pleistocene ice-sheet. The appendix is, that the elevated area sank under the weight of ice for which it was responsible, until, as a result of the sinking thus effected, the climate was so far ameliorated as to bring about the melting of the ice-sheet and the end of the glacial period. The appendix is sometimes stated in milder form, the depression resulting from the weight of the ice being looked upon as only one of the causes which brought about the dissolution of the ice-sheet. This view, both in its wider and in its more restricted sense, we believe to be without foundation. Its fallacy appears when the quantitative elements of the problem are considered.

Let it be assumed that northward elevation was the cause of the cold climate which made the development of the Pleistocene ice-sheet possible. Let it be assumed further (and this is the assumption most favorable to the doctrine here opposed), that the elevated region was in isostatic equilibrium at the time the ice began to accumulate. Let it be assumed also, that the average specific gravity of the mass of snow and ice of the ice-sheet was one-third that of the rocks of the earth's crust. On the doctrine of isostasy, depression should have accompanied the accumulation of snow and ice. When the central part of the snow-field had a depth of 300 feet, the maximum depression which it could have caused, under the assumed conditions, was 100 feet. At the minimum, therefore, the surface of the central part of the ice-field must have been 200 feet higher than the surface of the land before the ice-field formed. Nearer the margins of the ice-field, where the ice was thinner, both the depression of the land surface and the accompanying elevation of the snow surface would have been less; but each point of the surface of the snow-field must have been higher than the corresponding point of the surface of the land at the time the ice began to accumulate, and the temperature at all points must have been correspondingly reduced. Instead of being ameliorated by the depression of the land surface, the very conditions which brought about this depression were causing the climate to become progressively more severe. When the ice had attained a thickness of 3,000 feet, it might have occasioned a maximum depression of the subjacent land surface to the extent of 1,000 feet, and therefore a minimum elevation of the ice surface at the same point, to the extent of 2,000 feet. While, as before, both the depression of the subjacent land surface and the correlative elevation of the surface of the ice-sheet would have been less near the margins of the snow-field than at its center, it still remains true that each point of the entire surface of the ice must have been higher than the corresponding point of the surface of the land at the time the ice began to accumulate, and higher than the corresponding point of the surface of the ice at every earlier stage. When 3,000 feet of ice had accumulated, and when this body of ice had caused its full measure of depression, the temperature over it must have been reduced at each point by an amount corresponding to the actual increase of elevation of the snow surface over the pre-existent land surface at that point. The force of the point here made is in no way lessened if the depression caused by the accumulation of the ice lags behind the accumulation itself. In so far as the sinking lags behind the loading, the temperature of the surface is reduced beyond the limits indicated. The principles here referred to will neither be reversed in their operation, nor rendered nugatory, by further accumulation of ice. So long as the ice thickens, it will remain true at all times that each point of the surface of the ice-field must be higher than the corresponding point at any earlier stage in the process of accumulation, isostasy alone being considered. The elevation of the ice surface (and this is the surface which determines the climate), will overbalance any depression of the land surface which the ice can cause by the disturbance of isostatic equilibrium. There is, therefore, not only no tendency to the amelioration of climate as the result of excessive snow accumulation, but there is a constant reduction of temperature. Whatever may have caused the dissolution of the Pleistocene ice-sheet, it was not the amelioration of climate resulting from the depression caused by the weight of the ice itself, under conditions of isostasy. R. D. S.

⁂

WITH this number, THE JOURNAL OF GEOLOGY begins the publication of a series of articles on the geological surveys of the various states of the Union. These articles will be prepared, so far as practicable, by the official geologists of the several states. Their purpose is to publish to the geological world the present condition of geological work in the various regions with which they deal. They will indicate what has been done, and by whom. They will make known the various plans on which survey work has been prosecuted in the several states. They will state the problems which still remain to be solved, and something of their relative importance. They will bring out the scientific and economic advantages which have resulted, directly or indirectly, from the surveys already executed. They will indicate the general scope of the more important publications, both cartographic and textual, which have appeared, and while they are not intended to be bibliographic primarily, they will contain references to the more important publications and to such bibliographies as may have been compiled. In some cases, at least, they will give the cost of the work which has been accomplished. The plan also involves a series of articles on the surveys in foreign countries. It is hoped and believed that these papers will be of much value. A considerable period of time will necessarily elapse before the series is completed, but in the end it is believed that it will constitute a valuable compendium of geological work throughout the world.

R. D. S.